CE 0051

# HIGH PRESSURE MANIFOLDS FOR MEDICAL GASES

## *USER MANUAL*

**GENERAL WARNINGS**

***Read carefully the following instructions:***

- **Do not use grease or oil on the device. This can cause fire or explosions.**
- **Do not smoke and keep fire away from the device.**
- **The valves must be opened always SLOWLY.**
- **Be sure that the manifold is not in pressure, before doing any maintenance/replacement.**
- **Use always protective glasses during the operations.**
- **The device must be installed, used and maintained exclusively by qualified and trained staff.**
- **The manifold must be replaced only with another one with same features.**
- **Use only with fitting devices according to the related standards.**
- **Close with caps the connections not used.**
- **These instructions are part and parcel of the device and must be preserved for any referencies.**

***IMPORTANT (see fig 1)***

***The hand-wheel valves (4) on the oxygen manifolds have just a service function during the maintenance. In these manifolds the retaining is assured by a metallic sphere to avoid fire triggers caused by adiabatic compression but the leaks can be more than what's written at the point n° 4. Closing those valves (4), the retaining is assured and can be operated replacements of bottles without big leaks in the ambient. However, the perfect retaining is reached closing the connections (1) with fitting caps (3).***

## 1. Use destination

The high pressure manifolds for medical gases are generally used as collectors in medical gas distribution main plant according to the standard UNI EN 737-3, to convey the gas from the bottles to the primary regulation stage throughout an high flow-rate pigtail.

The connections are gas-specific to avoid connections of devices destined to be used with different gases.

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## 2. Manufacturer

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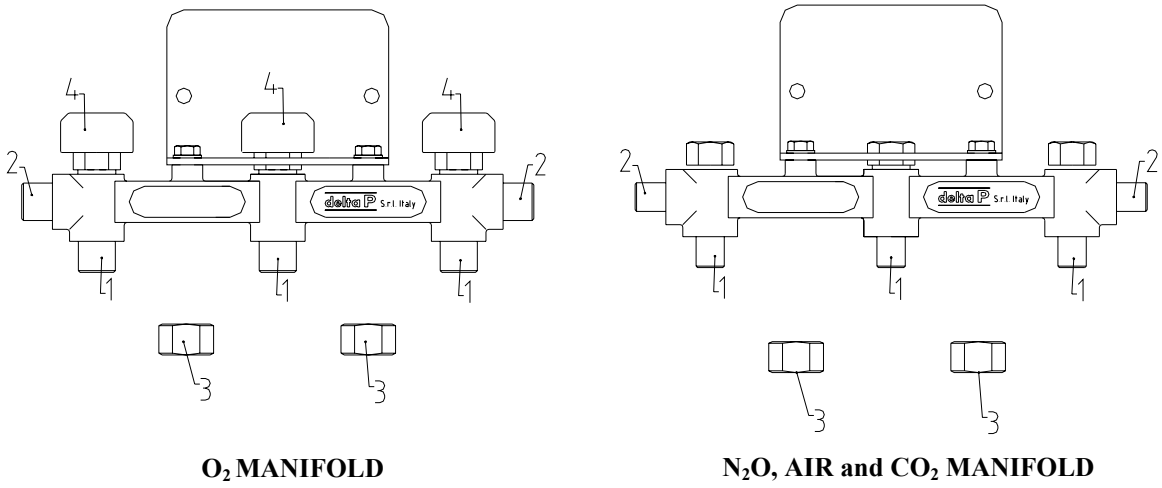
## 3. Pack content

The pack contains:

- n. 1 manifold.
- n. 2 gaskets.
- n. 2 caps.
- n. 1 copy of this manual.




**$O_2$ MANIFOLD** **$N_2O$, AIR and $CO_2$ MANIFOLD**

FIGURE 1.

CAPTION:

1. Input connection.
2. Output connection.
3. Input/output connection cap.
4. Hand-wheel valves (only for $O_2$).

## 4. Technical data

| | |
|---|---|
| **Body material:** | Brass |
| **Input/output connections:** | See table 1. |
| **Max inlet pressure:** | 200 bar for $O_2$ and A.C.<br>110 bar for $N_2O$ and $CO_2$ |
| **Operative and conservation temperature range:** | -20 °C÷ +60 °C |
| **Relative and conservation moistness range:** | 40% °C÷ 80% |

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*Table 1 – Input/output connections*

| Code | Description | Gas symbol | Gas | Thread standard |
|---|---|---|---|---|
| 8858-2008M | Manifold 2/3 places $O_2$ (MED) monoblock | $O_2$ | Oxygen | UNI 4406 |
| 9044-2008M | Manifold 5/6 places $O_2$ (MED) | | | |
| 8859-2008M | Manifold 2/3 places $N_2O$ (MED) monoblock | $N_2O$ | Nitrous oxyde | UNI 9097 |
| 9045-2008M | Manifold 5/6 places $N_2O$ (MED) | | | |
| 8860-2008M | Manifold 2/3 places A.C. (MED) monoblock | AIR | Air for breathing | UNI 4410 |
| 9046-2008M | Manifold 5/6 places A.C. (MED) | | | |
| 8861-2008M | Manifold 2/3 places $CO_2$ (MED) monoblock | $CO_2$ | Carbon dioxide | ISO 5145 |
| 9047-2008M | Manifold 5/6 places $CO_2$ (MED) | | | |

All the connections are gas-specific according to the standard UNI EN 737-3 par. 5.2.7 R.

## 5. Performances devided from the execution of the test according to the standard EN 13221

| | |
|---|---|
| **Mechanical strenght:** | >85.000 kPa (~ 850 bar) |
| **Leaks (with caps on the connections not used):** | $N_2O$, AIR e $CO_2$: MAX $4*10^{-8}$ mbar l/s ($2.4*10^{-6}$)<br>$O_2$ :MAX $2*10^{-5}$mbar l/s ($1.2*10^{-3}$ ml/min) |
| **Adiabatic compression:** | The $O_2$ device can resist at adiabatic compression phenomena. It has passed the adiabatic compression test scheduled by the standard EN 13221 |
| **Pressure drop:** | according to the standard EN 13221 |

## 6. Installation

***NOTE:*** Be sure that the material listed at point n°3 “Pack content” is available.

***Cautions:***

- Before the connection, be sure that the valves of the devices that must be connected (bottles, pigtail, etc.) are closed, and that the manifold is specific for the device that must be connected.
- Before the connection, be sure that the plant foresees alarm system for signaling the exhaustion of the bottles connected to the device.
- Use only flexible connections according to the standard EN 13221, and provided with an input and output thread as described at point n°4.
- Use only with other manifolds provided with thread according to the standard described at point n°4, with same performances of those listed at point 5.

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***NOTE:*** *The manifold exhausting valves must be installed on the connections (2) as described by the standard* UNI EN 737-3 par. 5.2.1 Note 2.

**Note about the use of the oxygen manifold valves (4):**
Use those valves as follows:

- Rotate the valve (4) CW to close it.
- Rotate the valve (4) CCW to open it.

A label is present, to indicate these two states.

***Procedure***

1. Fix the manifold in the position scheduled by the project. Fix it to the wall or to another solid support and its position height must be suitable to be easily reached by the pigtails for the connection to the bottles.
2. Close all the inputs (1) and outputs (2) not used, with the appropriate caps (3) (the figure n°2 shows an example of use with 2 inputs and 1 output).
3. Approch to each manifold connection scheduled (1) (2) the connection of the related pigtail. If it's necessary, the pigtail can be deformed but not stamped out,trying to maintain the diameter bigger than 12 cm.

   ***Note*****:** The input connection (1) are destined to be connected to the pigtail arriving from the bottles. The output connections (2) can be connected either to a device or another manifold. (see point 7).

4. Connect the pigtail to the scheduled connections (1) (2). Screw manually, then lock up using the suitable key.
5. For the oxygen manifold, open valves (4).

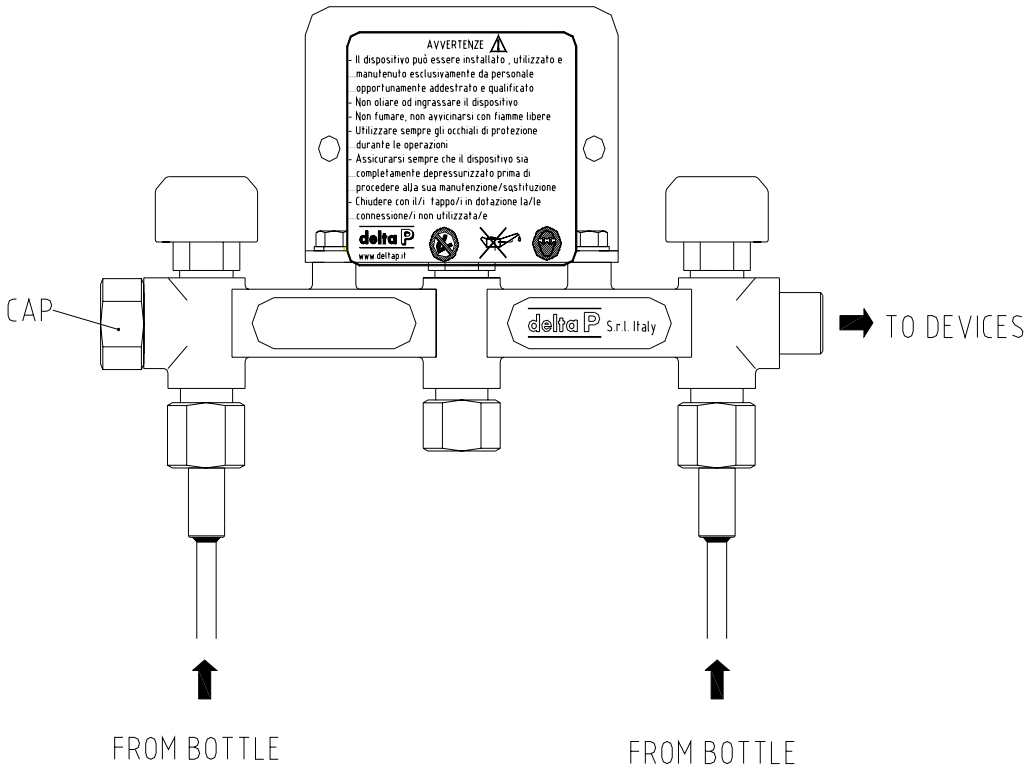
AVVERTENZE
- Il dispositivo può essere installato , utilizzato e manutenuto esclusivamente da personale opportunamente addestrato e qualificato
- Non oliare od ingrassare il dispositivo
- Non fumare, non avvicinarsi con fiamme libere
- Utilizzare sempre gli occhiali di protezione durante le operazioni
- Assicurarsi sempre che il dispositivo sia completamente depressurizzato prima di procedere alla sua manutenzione/sostituzione
- Chiudere con il/i tappo/i in dotazione la/le connessione/i non utilizzata/e
delta P
www.deltap.it
CAP
delta P S.r.l. Italy
TO DEVICES
FROM BOTTLE
FROM BOTTLE

FIGURA 2. – EXAMPLE OF CONNECTION A MANIFOLD WITH 2 INPUTS AND AN OUTPUT

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## 7. Installation of 2 or more manifolds

To install two or more manifolds, connect them with an high flow-rate connection, using their output connections (2). The figure below (fig.3) shows an example of connection between two manifolds.

***Note:*** are also available packs containing different configurations of manifolds. For more informations please contact our commercial department.

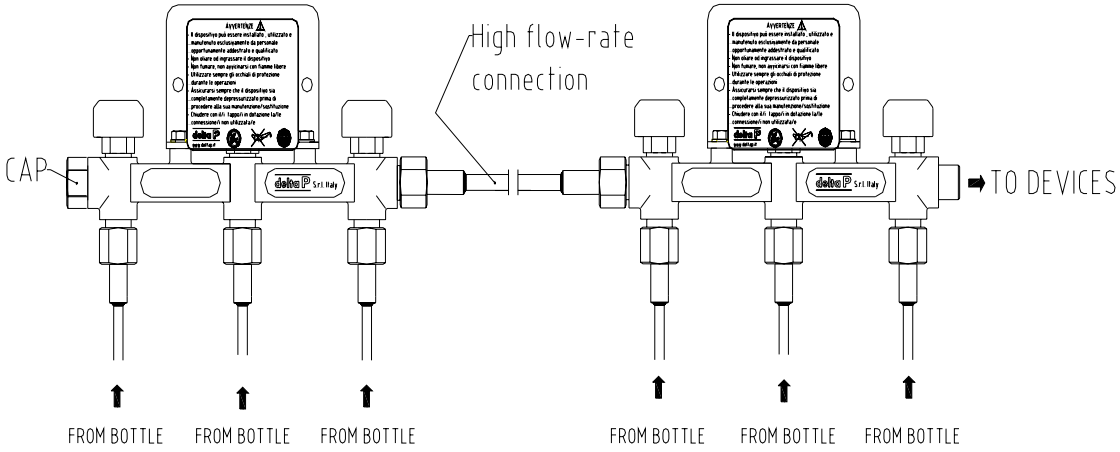


FIGURA 3. – EXAMPLE OF CONNECTION OF 2 MANIFOLD

## 8. Check, tests and start up procedure

The start up procedure consist of the following operations:

1. Check that nut are correctly locked up.
2. Open slowly the valves of the bottles.
3. Check that there are no gas leaks using the suitable fluid.
4. Open slowly the valves of the decompression board.

## 9. Use

***Important:*** during the ordinary use, the manifold connection(1) (2) can't be never opened or tampered.
In any case, before the opening of the connection, be sure that the manifold isn't in pressure.

***Warning:*** before the disconnection of the manifold, be sure that the supply of the plant is guarateed or that the interested wards have been alerted of the temporary interruption of gas supply.

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## 10. Manifold periodical checks, maintenance and replacement

***Cautions:***

- The maintenance must be done by authorized persons.
- Use only spare parts by delta P.
- The device life is rated in 10 years in ordinary use conditions. After this period the device should be replaced. However, it must be suddenly replaced, in case of damage conditions.
- If the performances listed at point 5, or the pressure drop values, should not be respected, provide with the solving of the malfunctioning or the replacement with a manifold of the same type.
- before the disconnection of the manifold, be sure that the supply of the plant is guarateed or that the interested wards have been alerted of the temporary interruption of gas supply.
- Check every 15 days the absence of leak (1) (2) using the suitable fluid.
- Check every year the correct working of the anti-return valves and the gaskets. In case of malfunctionung, provide with the replacements of the parts. However, these parts must be replaced every two years.

***Procedure***

1. Close slowly the valves of the connected devices.
2. Depressurize the manifold using the suitable discharge valve
3. Unscrew slowly the nut using the suitable key.
4. Check the complete depressurization of the manifold, then start with the replacement.
5. Then install the new manifold.

***Warning:*** be sure that the new manifold has the same configurations and performances of the one replaced.

## 11. Cleaning

Every 3 months verify the absence of dirty on the manifold. If dust or other impurity were found, the manifold must be cleaned without using solvents or inflammable substances, but using a cloth.

## 12. Manual validity

This manual is suitable for the following product codes:

| *Code* | *Description* |
|---|---|
| 8858-2008M | Manifold 2/3 places $O_2$ (MED) monoblock |
| 8859-2008M | Manifold 2/3 places $N_2O$ (MED) monoblock |
| 8860-2008M | Manifold 2/3 places Air (MED) monoblock |
| 8861-2008M | Manifold 2/3 places $CO_2$ (MED) monoblock |
| 9044-2008M | Manifold 5/6 places $O_2$ (MED) |
| 9045-2008M | Manifold 5/6 places $N_2O$ (MED) |
| 9046-2008M | Manifold 5/6 places Air (MED) |
| 9047-2008M | Manifold 5/6 places $CO_2$ (MED) |

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